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ABSTRACT

This study used meta-analysis research techniques to determine if there are differences in General Aptitude Test Battery (GATB) validities and test scores between males and females. The sample consisted of 26,111 subjects from 122 Specific Aptitude Test Battery (SATB) validation or revalidation studies analyzed since 1972. Four approaches were used to analyze the differences in validities between males and females. The first approach used th chi-square. Neither the cumulative chi-square nor the number of significant chi-squares showed significant differences between males and females. The second approach compared average differences in validities weighted by sample size. The average difference was .029 correlation points. The third approach compared average validities weighted by sample size. The largest difference was .05 correlation points. The fourth approach compared job family validities and showed no significant differences. The overall conclusion of this study is that there are no meaningful differences in GATB validities between males and females. Mean score differences were also analyzed. Males scored significantly higher on General Learning Ability, Numerical Aptitude, and Spatial Aptitude. Females scored significantly higher on Form Perception, Clerical Perception, Motor Coordination, and Finger Dexterity. There were no significant differences on Verbal Aptitude and Manual Dexterity. (Author)

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THE EFFECT OF SEX ON GENERAL APTITUDE TEST BATTERY VALIDITY AND TEST SCORES

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TABLE OF CONTENTS

	PAGE
FOREWORD	i
SUMMARY	ii
INTRODUCTION	1
SAMPLE	4
PROCEDURE	4
RESULTS	9
DISCUSSION AND CONCLUSIONS	15
REFERENCE NOTES	17
REFERENCES	17
APPENDIX	19

FOREWORD

The United States Employment Service conducts a test research program for developing testing tools useful in vocational counseling and placement.

The purpose of this series of reports is to provide results of significant test research projects as they are completed. These reports will be of interest to users of USES tests and to test research personnel in State agencies and other organizations.

Summary

This study used meta-analysis research techniques to determine if there are differences in General Aptitude Test Battery (GATB) validities and test scores between males and females. The sample consisted of 26,111 subjects from 122 Specific Aptitude Test Battery (SATB) validation or revalidation studies analyzed since 1972.

Four approaches were used to analyze the differences in validities between males and females. The first approach used the chi-square from Hunter, Schmidt, and Hunter (1979). Neither the cumulative chi-square nor the number of significant chi-squares showed significant differences between males and females. The second approach compared average differences in validities weighted by sample size. The average difference was .029 correlation points. The third approach compared average validities weighted by sample size. The largest difference was .05 correlation points. The fourth approach compared job family (Hunter, Note 1) validities and showed no significant differences.

The overall conclusion of this study is that there are no meaningful differences in GATB validities between males and females.

Mean score differences were also analyzed. Males scored significantly higher on General Learning Ability, Numerical Aptitude and Spatial Aptitude. Females scored significantly higher on Form Perception, Clerical Perception, Motor Coordination and Finger Dexterity. There were no significant differences on Verbal Aptitude and Manual Dexterity.

Introduction

The U.S. Employment Service (USES), in cooperation with State employment services, has conducted a continuing program of occupational test research and development since the mid 1930's. Most of this effort has been devoted to developing and researching the General Aptitude Test Battery (GATB). The GATB consists of 12 tests measuring the following nine vocationally-relevant aptitudes:

General Learning Ability (G)
Verbal Aptitude (V)
Numerical Aptitude (N)
Spatial Aptitude (S)
Form Perception (P)
Clerical Perception (Q)
Motor Coordination (K)
Finger Dexterity (F)
Manual Dexterity (M)

The validation of the GATB for specific occupations has resulted in the development of over 470 Specific Aptitude Test Batteries (SATBs). These batteries consist of combinations of two, three, or four GATB aptitudes with associated cutting scores. All of the SATBs were developed from empirical research studies. In each study criterion data measuring job or training proficiency were collected along with GATB test scores. The validity of the aptitudes was measured by the correlation between aptitude test scores and the criterion.

One issue that the USES has been concerned with is what variables affect or moderate GATB validities. Some of the variables that have been postulated to moderate test validity are minority group status, sex, geographic area, age, education and work experience. The present study looks at one of these variables - sex. The study uses meta-analysis research techniques on SATB validation data to determine if there are differences in validities and test scores between males and females.

The issue of whether sex moderates test validity has important implications for the conduct of GATB validity research and is of interest to both psychologists who develop tests and employers who are concerned with test costs and benefits. Psychologists are interested in the variable of sex because the Uniform Guidelines on Employee Selection Procedures (U.S. Equal Employment Opportunity Commission, 1978) indicate that if a selection procedure has adverse impact, the selection procedure must be shown to be valid for the adversely affected group. Employers are interested in selection procedures with the highest utility. If a selection procedure has different validities for males and females, using the same selection procedure for both sexes decreases utility and leads to a less productive workforce.

More data exists on some aptitude-related sex-differences issues than others. There is a great deal of literature on differences in mean aptitude scores - especially cognitive aptitudes - but very little on differences in aptitude validities. Eight sources of sex-related data on GATB, or GATB-like, mean aptitude scores were examined (Anastasi, 1958; Jensen, 1980; Lips and Colwill, 1978; Maccoby, 1966; Minton and Schneider, 1980; Seward and Seward, 1980; Sherman, 1978; United States Department of Labor, 1970). In these studies, the comparisons of mean scores for each GATB or GATB-like aptitude suggest the following conclusions:

General Learning Ability.....no difference
Verbal Aptitude.....females score higher
Numerical Aptitude.....males score higher
Spatial Aptitude.....males score higher
Form Perception.....females score higher
Clerical Perception.....females score higher
Motor Coordination.....females score higher
Finger Dexterity.....females score higher
Manual Dexterity.....no difference

The data bearing on sex-related differences in aptitude validity is scanty. Schmitt, Mellon and Bylenga (1978) examined 6219 male-female validity pairs.

The majority of the validity pairs (6084) used academic criteria. For these, females showed significantly higher validities. The remaining validity pairs (135) used employment criteria and males showed significantly higher validities. In both instances the differences between the validities of males and females were numerically small.

Schrader (1971) found that females had higher validities than males when Scholastic Aptitude Test (SAT) scores were correlated with grades obtained in liberal arts and general college programs. This relationship held true for verbal SAT scores (M=.33, F=.41) and math SAT scores (M=.30, F=.36). These were median validities of samples where N was greater than or equal to 85 subjects.

The United States Department of Labor (1970) analyzed Employment Service Specific Aptitude Test Batteries which had samples of at least 30 males and 30 females. The aptitude norms were applied separately to the male and female subgroups, and the phi coefficients and probability values were computed. The data showed that in two of 11 cases the overall norms were predictive for females but not males; in one instance the norms were predictive for males but not females, and in eight instances the norms were predictive of job performance for both males and females. The conclusion is that the GATB does not show differential validity between the sexes.

The last source of data comes from the Armed Service Vocational Aptitude Battery (ASVAB) validation studies (United States Department of Defense, 1980). The data indicate that the ASVAB shows differential validity between males and females. The validities were higher for males on all six ASVAB composites. This seems to occur for two reasons: (1) The predominant sex, in single sex-dominated jobs, shows higher validities than the less predominant sex. That is, males show higher validities than females in jobs

that have mostly males, and females show higher validities than males in jobs that have mostly females; (2) Most jobs studied using the ASVAB are male dominated.

Sample

The sample consists of available data from Specific Aptitude Test Battery validation or revalidation studies analyzed since 1972. The total N is 26,111 from 122 studies. One hundred and fourteen studies (N=23,558) used a concurrent design and eight studies (N=2,553) used a longitudinal design. Table 1 gives minority and sex breakdown.

Most of the criterion data consisted of the sum of scores from two administrations of the Standard Descriptive Rating Scale. The scale was used to get ratings from supervisors on five aspects of job performance (quantity, quality, accuracy, job knowledge and job versatility) as well as "all-around" ability. However, other types of criterion data were collected and criteria were combined in different ways (see Table 2). The Appendix contains a listing of all 122 studies and the number of individuals of each sex in each study.

Procedure

In each study, validity coefficients for the nine GATB aptitudes were computed for each sex that had more than 25 subjects. Validities were analyzed in two ways for the 37 studies that had more than 25 males and more than 25 females.

The first method is based on the Hunter, Schmidt and Hunter (1979) analysis of differential validity. This method involves computing the following chi-square for each validity pair

$$\chi^2 = \frac{(Z_1 - Z_2)^2}{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}$$

> "where Z_1 and Z_2 are the validity coefficients in Fisher Z form for males and females, and N_1 and N_2 are sample sizes for males and females".

The number of significant chi-squares was computed as well as the cumulative chi-square.

In the second method, the difference in validities between males and females was computed for each of these studies and weighted by the combined sample size. The mean of these weighted differences was computed for each of the nine aptitudes.

There were 85 studies that didn't have more than 25 subjects from both sexes. These studies were combined with the studies that had more than 25 males and more than 25 females. Validities for this larger data set were analyzed in two ways. The first compared validities weighted by sample size. Average validities, weighted by sample size, were computed for each sex and tested for differences. The second analysis compared job family validities (Hunter, Note 1) between sexes. Hunter developed a grouping system of jobs based on the Data and Things ratings of the occupational codes in the Dictionary of Occupational Titles (DOT) (United States Department of Labor, 1977). Each job in the DOT is placed in one of the five job families (see Table 3). The regression weights for each job family were used to get predicted criterion scores and the correlation was computed between predicted and actual criterion scores for each study. Average validities, weighted by sample size, for each of the five job families were computed for each sex and critical ratios computed between males and females.

Mean scores were compared by computing t-tests between males and females for each aptitude on the total sample.

TABLE 1

Ethnic/Minority Composition of Sample for Males and Females

N=25,288[a]

Ethnic/Minority	Males N=11,650	Females N=13,638
Black	2,722	4,551
American Indian	226	182
Asian	192	217
Hispanic	870	851
White	7,640	7,837

[a]Information unavailable for 823.

TABLE 2

Number of Studies and Subjects for Each Criterion Type

Type of Study	# of Studies	# of Individuals	Criterion Measure CR1	CR2	CR3
Standard DRS Concurrent	94	19,942	Standard DRS	Standard DRS	Sum of CR1 and CR2
Two criteria collected but only one used as final	1	119	Special DRS	Work Sample	CR2
Multiple Hurdle	2	647	Standard DRS	Course grades	
	1	933	Special DRS	Standard DRS	
	1	95	Course grades	Standard DRS	
Final criterion is combination of different criteria	1	213	Special DRS	Ranking	Combination of CR1, CR2
	1	81	Standard DRS	Performance Model	Combination of CR1, CR2
	1	123	Special DRS	Standard DRS	Combination of CR1, CR2
	1	286	Mixed Standard	Standard DRS	Combination of CR1, CR2
Final criterion is combination of same criteria (not Standard DRS)	1	119	Course grades	Course grades	Sum of CR1 and CR2
	3	723	Broad category rating	Broad category rating	Sum of CR1 and CR2
	1	141	Ranking	Ranking	Sum of CR1 and CR2
	10	1,902	Special DRS	Special DRS	Sum of CR1 and CR2
Longitudinal Standard DRS	1	81	Standard DRS	Standard DRS	Sum of CR1 and CR2
Only one criterion	1	270	————	Special DRS	————
	1	107	Mixed Standard Rating Scale	————	————
	1	329	Course grades	————	————
	122	26,111			

TABLE 3

Job Family and Test Battery Composition

Job Family	Contribution to Composite: Cognitive GVN	Perceptual SPQ	Psychomotor KFM	DOT Data-Things Code
1	59%	30%	11%	T=0=Setting up
2	13%		87%	T=6=Feeding-Offbearing
3	100%			D=0=Synthesizing =1=Coordinating
4	73%		27%	D=2=Analyzing =3=Compiling =4=Computing
5	44%		56%	D=5=Copying =6=Comparing

Results

The results for the analysis of validity for the 37 studies that had more than 25 males and more than 25 females are shown in Table 4. The first column shows the number of chi-squares significant at the .05 level. When a number of significance tests are performed, a certain number would be expected to be significant by chance. That is, if a number of samples were drawn from a population for which it was known that there are no differences between groups, for some of these samples the tests of differences would be significant. Determining how many tests of differences would be expected to be significant if there are no differences in the population is discussed by Brozek and Tiede (1952) and Cross and Chaffin (1982). The binomial probability distribution was used to determine the number of tests expected to be significant when up to 49 studies are involved. For 50 or more studies the normal distribution was used to determine the number of tests expected to be significant.

The binomial probability distribution indicates that when 37 tests of difference are calculated, four or less would be expected to be significant at the .05 level even if the samples were drawn from the same population. None of the aptitudes had more significant chi-squares than would be expected. Looking at all aptitude comparisons (i.e. nine aptitudes times 37 studies), 333 chi-squares were computed. Only 21 chi-squares were significant at the .05 level, which is less than the 25 which would be required to indicate significant differences.

The second column of Table 4 shows cumulative chi-square results for each aptitude. None of the aptitude cumulative chi-squares were significant and the total cumulative chi-square was barely significant at the .05 level. This result should be viewed with caution because the samples are not independent. In each study, validity coefficients were computed for the nine aptitudes using the same criterion.

TABLE 4

Number of Chi-Squares Significant at .05 Level, Cumulative Chi-Squares and Mean Weighted Differences in Validities

Aptitude	Number of Significant Chi-Squares	Cumulative Chi-Square	Weighted Mean Difference in Validities
G	3	42.34	-.053
V	2	41.43	-.057
N	2	41.99	-.044
S	3	45.59	-.014
P	2	46.60	-.015
Q	2	39.27	-.012
K	1	29.98	-.017
F	2	42.77	-.017
M	4	48.22	-.030
Total	21	378.19*	-.029

*Significant at .05 level

The third column of Table 4 shows the mean difference in validities between males and females weighted by the total sample size. In computing the difference in validities for each study, the female validity coefficient was subtracted from the male validity coefficient. All of the mean differences are negative indicating a larger female validity. The total mean difference was -.029 in correlation units.

The results for the combined data (studies with more than 25 males or females) are shown in Table 5 and 6. The average validities, weighted by sample size, for males and females are shown in Table 5. There were significant differences for aptitudes S and M, but these differences are small in magnitude (.02 and .05 correlation points, respectively). Across all nine aptitudes, the difference in mean validities between males and females is .006 correlation points. The results for job families based on Hunter (Note 1) are shown in Table 6. Only job families 4 and 5 had enough males and females to compute critical ratios. Neither of the critical ratios were significant.

Table 7 shows the results of comparisons of mean scores for males and females for the total sample. Males scored significantly higher on aptitudes G, N and S. Females scored significantly higher on aptitudes P, Q, K and F. There were no significant differences for aptitudes V and M. These results are similar to the summary results of GATB-like aptitudes presented earlier. The only differences were that previous research indicates no difference on G and females higher on V, while the present research indicates males higher on G and no difference on V.

TABLE 5

Mean Validities (Weighted by Sample Size)
for Males and Females and Critical Ratios

Aptitude	Males N=12,096	Females N=13,488	Critical Ratio
G	.23	.22	.80
V	.17	.18	-.88
N	.23	.22	.80
S	.16	.14	2.16*
P	.15	.17	-1.76
Q	.17	.17	-.32
K	.10	.11	-1.36
F	.11	.11	-.24
M	.09	.14	-3.59**

*Significant at .05 level
**Significant at .01 level

TABLE 6

Mean Weighted Validities of Job Family Regression Equations for Males and Females

Job Family	Total			Males			Females			Critical Ratio
	Number of Studies	N	Validity	Number of Studies	N	Validity	Number of Studies	N	Validity	
1	5	906	.15	5	865	.15	0	—	—	—
2	1	126	.09	0	—	—	1	125	.09	—
3	1	75	.28	1	73	.27	0	—	—	—
4	67	16,179	.24	51	8,793	.24	37	7,101	.25	-.66
5	48	8,825	.21	23	2,365	.20	41	6,262	.22	-.70

TABLE 7

Means, Standard Deviations and T-Tests for Males and Females for Total Sample

	Males N=12,416[a]		Females N=13,695[b]		
Variable	Mean	SD	Mean	SD	T-test
Age	31.4	10.2	31.9	11.4	-3.66**
Ed	12.1	1.9	12.0	1.7	4.02**
Plt	58.2	68.9	47.0	57.5	13.26**
Tot	79.8	88.1	59.5	68.2	19.98**
G	98.7	18.8	91.9	18.5	29.54**
V	95.9	15.7	95.8	16.3	.52
N	96.3	19.9	91.8	19.9	18.04**
S	104.7	20.1	94.2	18.4	43.83**
P	104.4	21.9	106.9	22.6	-9.04**
Q	106.6	17.1	113.9	19.3	-32.10**
K	99.9	19.1	108.4	18.2	-36.56**
F	95.1	21.5	99.8	21.8	-17.66**
M	105.2	22.6	105.0	22.2	.92

[a]N for plant experience is 10,240, N for total experience is 11,422.
[b]N for plant experience is 12,684, N for total experience is 12,996.

**Significant at .01 level.

Discussion and Conclusions

The primary purpose of this study was to determine if the validity of the GATB is different for males and females. Four different analyses were performed on two overlapping subsets of the total sample. The first subset was the 37 studies (N=9,062) that had more than 25 sample members from each sex. This subset was analyzed using the chi-square described in Hunter, et al. (1979) and average differences in validities, weighted by sample size. The second subset consisted of studies that had more than 25 sample members of one sex and 25 or less sample members of the other sex. In these studies the only sample members considered were those in the sex that had more than 25 sample members (N=25,584). This subset, in combination with the first, was analyzed by comparing average validities, weighted by sample size, for the nine GATB aptitudes and job families.

The results for the studies with more than 25 individuals from each sex are clear - males and females do not differ in GATB aptitude validities. None of the analyses showed significant differences in validities between males and females. These results indicate that for jobs with a substantial number of both male and female workers, validities between males and females are not different.

The results for studies that had more than 25 sample members from one sex but 25 or less of the other sex are less definitive. When this subset was combined with the first, analysis of mean validities weighted by sample size showed significant differences for aptitude S (with males slightly higher) and aptitude M (with females slightly higher). This result may be due to the differences in the nature of jobs which are predominated by either males or females. The analysis of job families showed no differences in validities between males and females. This analysis was complicated by the fact that only job families 4 and

5 had enough sample members for analysis. Since the job family regression equations will be used for the selection of applicants when the pilot validity generalization project in North Carolina is expanded, these results support the use of the same tests for both males and females.

The Schmitt et al. (1978) study examined 135 validity pairs that used employment criteria. They found the overall validity was .225 for males and .187 for females. These validities are significantly different from each other but the difference is trivial in magnitude (.038 correlation points). The authors caution against the generalizability of the employment criteria findings because of the small number of validity pairs analyzed and their lack of independence.

The present validity analyses employed 1431 validity coefficients that used employment criteria compared to 270 for the Schmitt et al. analysis. For this reason the difference of .006 correlation points may be a more accurate reflection of population values for employment criteria validity data.

The results show that there are differences in mean GATB aptitude scores between males and females. Males scored significantly higher on aptitudes G, N and S, while females scored significantly higher on aptitudes P, Q, K and F. The minor differences between these results and previous findings may reflect a unique combination of occupations studied or differences (chance or otherwise) between samples which are almost entirely male or female.

The overall conclusion of this study is that there are no meaningful differences in GATB validities between males and females. This means that GATB users do not have to worry about the GATB predicting job success differently for males and females.

Reference Notes

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APPENDIX

DOT Title and Code and Number of Subjects from each Sex

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
2	Stock Clerk	222.387-058	151	113	38
4	Sewing Machine Operator	787.682-046	208	0	208
7	Laboratory Tester	029.261-010	95	76	19
9	Central Office Operator	235.462-010	102	2	100
10	Stenographer	202.362-014	622	5	617
10	Clerk-Typist	203.362-010	431	6	425
10	Typist	203.582-066	141	0	141
11	Carpenter	860.381-022	154	154	0
11	Carpenter	860.381-022	119	119	0
12	Machinist	600.280-022	283	282	1
28	Packager, Hand	920.587-018	445	11	434
31	Checker II	209.687-010	121	13	108
31	Checker II	209.687-010	59	5	54
34	Bindery Worker	653.685-010	185	57	128
38	File Clerk II	206.367-014	211	2	209
43	Automobile Mechanic	620.261-010	425	424	1
44	Punch-Press Operator I	615.482-022	89	54	35
45	Shipfitter	806.381-046	252	244	8
47	Nursery School Attendant	359.677-018	174	18	156

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
53	Spinner, Frame	682.685-010	180	5	175
61	Plumber	862.381-030	253	253	0
61	Plumber	862.381-030	411	411	0
63	Garment Folder	789.687-066	103	0	103
68	Refinery Operator	549.260-010	194	182	12
71	Cosmetologist	332.271-010	386	35	351
72	Electrician	824.261-010	394	392	2
72	Electrician	824.261-010	253	253	0
74	Central-Office Repairer	822.281-014	142	130	12
80	Radiologic Technologist	078.362-026	137	56	81
82	Sheet-Metal Worker	804.281-010	152	146	6
101	Assembler, Automobile	806.684-010	213	160	53
115	Weaver	683.682-038	126	37	89
120	Fire Fighter	373.364-010	130	130	0
124	Tractor-Trailer-Truck Driver	904.383-010	320	313	7
126	Welder, Combination	819.384-010	220	215	5
131	Industrial-Truck Operator	921.683-010	202	200	2
135	Production-Machine Tender	609.685-010	227	173	54
141	Bench Assembler	706.684-642	160	41	119
144	Machinist, Wood	669.380-014	100	86	14
145	Cashier-Checker	211.462-014	119	9	110

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
153	Loom Fixer	683.260-018	156	155	1
165	Packager, Hand	920.587-018	102	46	56
168	Yarn-Texturing-Machine Operator	589.685-102	111	7	104
177	Millwright	638.281-018	302	302	0
180	Keypunch Operator	203.582-030	353	4	349
182	Laborer, Stores	922.687-058	127	67	60
199	Audit Clerk	210.382-010	300	33	267
200	Reservations Agent	238.367-018	310	49	261
207	Welder, Arc	810.384-014	162	160	2
211	Welder, Arc	810.384-014	461	442	19
211	Welder, Arc	810.384-014	81	59	22
217	Proof-Machine Operator	217.382-010	243	27	216
220	Coil Winder	724.684-026	115	28	87
228	Injection-Molding-Machine Tender	556.685-038	155	6	149
231	Surgical Technician	079.374-022	250	63	187
235	Metal Fabricator	619.360-014	173	160	13
236	Police Officer I	375.263-014	121	118	3
238	Cook	313.361-014	114	44	70
239	Ward Clerk	245.362-014	185	5	180
259	Teller	211.362-018	291	34	257

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
266	Drafter, Civil Drafter, Geological Drafter, Mechanical Drafter, Structural	005.281-010 010.281-018 007.281-010 005.281-014	326	296	30
267	Tire Builder, Automobile	750.384-010	239	228	11
270	Nurse, Licensed Practical	079.374-014	204	3	201
274	Food-Service Worker, Hospital	355.677-010	170	34	136
276	Salesperson, General Merchandise	279.357-054	171	16	155
278	Sales Clerk	290.477-014	163	15	148
280	Structural-Steel Worker	801.361-014	249	249	0
281	Electronics Assembler	726.684-018	56	0	56
282	Nurse Aide	355.674-014	136	0	136
286	Computer Operator	213.362-010	213	172	41
287	Psychiatric Aide	355.377-014	334	93	241
309	Proof-Machine Operator	217.382-010	172	9	163
310	Electronics Assembler	726.684-010	185	15	170
313	Automobile-Body Repairer	807.381-010	107	107	0
326	Respiratory Therapist	079.361-010	496	225	271
327	Psychiatric Technician	079.367-022	384	134	250
329	Administrative Clerk	219.362-010	407	19	388
330	Chemical Operator III	559.382-018	62	62	0

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
332	Hotel Clerk	238.362-010	406	164	242
335	Extruding-Machine Operator	691.382-010	142	139	3
336	Knitting-Machine Operator	685.665-014	209	52	157
342	Water-Treatment-Plant Operator	954.382-014	222	221	1
343	Operating Engineer	859.683-010	90	90	0
343	Operating Engineer	859.683-010	270	268	2
360	Yarn Winder	681.685-154	207	6	201
363	Maintenance Repairer, Factory or Mill	899.281-014	233	233	0
370	Maintenance Mechanic	638.281-014	141	141	0
375	Lather	842.361-010	114	114	0
376	Mailing-Machine Operator	208.462-010	128	18	110
379	Transportation Agent	912.367-014	131	123	8
381	Electronics Assembler	726.684-018	100	0	100
393	Hospital-Admitting Clerk	205.362-018	178	9	169
398	Teacher Aide II	249.367-074	266	7	259
407	Quality Control Technician	529.387-030	152	17	135
414	Assembler, Electrical Accessories I	729.687-010	191	38	153
427	Spooler Operator, Automatic	681.686-018	126	1	125
436	Food-Service Worker, Hospital	355.677-010	127	13	114
447	Welder, Production Line	819.684-010	177	157	20

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
456	Assembler, Small Products	739.687-026	183	35	148
465	Covering-Machine Operator	681.685-038	65	0	65
466	Material Handler	929.687-030	44	44	0
467	Electronics Assembler	726.684-018	276	4	272
468	Cigarette Inspector	529.567-010	64	1	63
469	Chemical Operator II	558.585-014	246	245	1
470	Weaver	769.684-050	81	29	52
471	Electronics Inspector	726.684-022	644	20	624
472	Appliance Assembler, Line	827.684-010	107	42	65
473	Gambling Dealer	343.467-018	933	541	392
473	Gambling Dealer	343.467-018	123	62	61
1001	Central-Supply Worker	381.687-010	431	74	357
1002	Data Typist	203.582-022	174	7	167
1003	Etched-Circuit Processor	590.684-018	258	19	239
1004	Cytotechnologist	078.281-010	131	14	117
1005	Assembler	723.684-010	91	3	88
1006	Machine Operator II	619.685-062	247	172	75
1007	Supervisor	529.137-026	75	73	2
1008	Power-Reactor Operator	952.362-022	329	293	36
1009	Customer-Service Representative	239.367-010	278	33	245

SATB No. or Study No.	DOT Title	DOT Code	Number of Subjects		
			Total	Male	Female
1010	Meter Reader	209.567-010	286	276	10
1011	Packager, Hand	920.587-018	203	6	197
1012	Environmental-Control-System-Installer-Servicer	637.261-014	262	262	0
3048	Pipe Fitter	862.261-010	95	52	43